St. Louis Public Library
1301 Olive Street
St. Louis, MO 63103

Title: “Reducing the Digital Divide: An Outcome-Based Model for Evaluating School-Aged Children’s Use of Technology in an Urban Public Library (Project CATE)”

Reducing the Digital Divide: An Outcome-Based Model for Evaluating School Aged Children's Use of Technology
In an Urban Public Library (Project CATE)

ABSTRACT

Need: This demonstration project meets a national and a local need to evaluate whether the digital divide is or can be effectively reduced for school age children by the presence of computers in public libraries. An exportable case study in the St. Louis Public Library (SLPL), a research-oriented library known for successful services in a city where 85 % of the children are at risk, addresses this need. A 1999 survey shows the St. Louis community receives $7 of benefits for every $1 of cost. The library is a recipient of Gates Learning Foundation and e-rate funds, and computers are used heavily by its child population. But, like many other public libraries around the country, it has no systematic way to plan, evaluate, and thus improve children's access to and use of this massive infusion of technology.

Project Goals: The project's goals meet all three national priorities of the IMLS National Leadership Grants for Libraries -- Demonstration Projects, and brings into library practice an evaluation method recommended by IMLS to be used as appropriate, i.e., outcome based measurement.

- **Goal 1:** To develop and demonstrate use of a comprehensive outcome-based model that public librarians can adopt or adapt to plan, evaluate, and improve children's access to and use of technology in an urban public library setting using market research techniques (Children's Access to Technology or CATE model).
- **Goal 2:** To train SLPL librarians, and subsequently librarians nationwide, to adopt or adapt and apply this outcome-based model to plan, evaluate, and improve school age children's access to and use of technology.

Project Activities: The activities of the project, designed to gather relevant data for measuring the quality of library services, will take place in three branches of the SLPL in the following five phases:

Phase 1: Train librarians; collect baseline and market research data (surveys, interviews, and focus groups). (December 2000 - March 2001)
Phase 2: Develop CATE outcome-based model and refine using Delphi Study**.** (April – June 2001)
Phase 3: Train librarians to use outcome-based model for planning and evaluation. Develop, deliver, and evaluate pilot interventions using CATE model**.** (July 2001- June 2002)
Phase 4: Measure and analyze overall program outcomes using data collection methods in phase 1, applying CATE model**.** (June 2002 – August 2002)
Phase 5: Disseminate CATE model through publications, products, and a web-based course. (December 2000 – November 2002 -- throughout the project)

Project Leaders: The P.I., Dr. L. Holt, Children's Coordinator for SLPL, accomplished researcher and administrator; sub-contractors, Drs. Dresang and Gross, Florida State University, experts in evaluation of children's services and experienced trainers; and consultant Dr. J. McNeal, Texas A&M University, expert in market research with children, are nationally recognized leaders in their fields.

Anticipated Results: The anticipated result is an outcome-based model that can be used to plan, evaluate, and improve children's access to and use of technology in any urban public library and a method to train librarians to adopt or adapt this model in their local communities. The project as a whole will be guided and then evaluated by ten measurable objectives. **Evaluation:** Formative evaluation will take place throughout. Summative evaluation will include a panel of experts in children's library services who will evaluate the project at its close, judging whether the objectives have been met. **Dissemination:** The project results will be disseminated and sustained with a manual, a web-based portfolio, and a 3-credit web course available nationally. The anticipated benefit for the Nation is a way to know that investment in public library technology will be evaluated and improved to reduce the digital divide for children who need it most.

Reducing the Digital Divide:
An Outcome-Based Model for Evaluating School Aged Children's Access to and Use of Technology In an Urban Public Library (Project CATE)

NARRATIVE

National Impact

Children and the digital divide: This demonstration project addresses a national priority: reducing the digital divide.[1] The study is concerned with children between 9 and 13,[2] living in a large urban center and the librarians who work with them. The Annie E. Casey Foundation finds that, "Nothing predicts bad outcomes for a kid more powerfully than growing up poor . . .. child poverty has been rising most consequentially in large cities." Children living in poverty in large urban centers are the most likely to be affected by the digital divide.

The role of public libraries in reducing the digital divide: Public libraries, historically prime participants in literacy efforts, are at the center of a nationwide 21st century literacy campaign to reduce the digital divide for high risk children. The Children's Partnership (TCP), a research and advocacy group to which the American Library Association (ALA) and forty other organizations and corporations belong, has chosen "to ensure quality digital media is accessible to all young people" as one of it three multiyear initiatives.[3] ALA has defined children's skillful use of technology as part of 21st century literacy, and the Public Library Association names "information literacy" as an essential role in *Planning for Results.*[4] According to a Benton Foundation study, the public agrees with this effort, ranking computers for children who lack them as a very important goal for public libraries.[5]

Funding for technology in public libraries: Private enterprise and the government have joined hands with libraries to reduce the digital divide by providing access to technology in public libraries located in areas with a large percentage of children living in poverty. The Gates Learning Foundation funds the acquisition of computers and hardware.[6] The Telecommunications Act of 1996 produced the e-rate that makes it possible for libraries to provide internet access to library users, including children, at an affordable rate.[7] More urban than rural libraries have internet access and seventy-nine percent of public libraries in urban areas of extreme poverty are wired.[8]

The resulting problem: That children need access to computers is widely accepted, but no evaluations have been conducted about what's happening with technology and children in the public library, if they use it, how they use it, and how to improve that use.[9] Is the money invested reducing the digital divide in terms of its impact on children? Are they really experiencing better access to information? Are they becoming skillful at accessing and using that information? Are they learning more and developing critical thinking skills? How can public librarians assist with this,

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[1] Demonstration projects are defined by IMLS as "the implementation of one potential solution to a problem in a real-world environment, including evaluation of its effectiveness and dissemination of results." The identification of appropriate investigative methodologies is part of this demonstration project. The term "Digital Divide" describes an individual's or community's lack of access to computers and online resources.

[2] The term "school age" is used to describe children between preschool/early readers and teenagers in high school.

[3] See *America's Children in the 21st Century: Putting Ideas to Work. A Progress Report from the Children's Partnership, 2000.* http://www.thechildrenspartnership.org.

[4] See http://www.ala.org/work/alaction2005.html and http://www.pla.org/plansvce.htm.

[5] Benton Foundation, 1996. *Buildings, books, and bytes: Libraries and Communities in the Digital Age*, http://benton.org/Library/Kellogg/buildings.html A 1995 USDOE study verifies heavy use of public libraries by children.

[6] As of January 2000, the Gates Learning Foundation had distributed computers to 1600 libraries. Geocoding is used to select libraries that are in the most economically needy communities. See http://www.gatesfoundations.org/Libraries/.

[7] See http://www.sl.universalservice.org/. The poorer the community, the larger the discount. The number of children eligible for free and reduced lunch determines the level of poverty of a library or school community.

[8] Bertot, J.C & McClure, C.R., "Moving Toward More Effective Public Internet Access: 1998 National Survey." (NCLIS) http://www.ala.org/oitp. Robbin, Alice. "We the People: One Nation, a Multicultural Society." *Library Trends 45* (in press).

[9] Lisa Guernsey, "O.K., Schools Are Wired. Now What?" *New York Times.* January 7, 2000, finds only 3 studies conducted in public schools where uncertainty also exists about how children are/should be using computers.

or can they? No one currently knows. Librarians as well as (we) the public and private donors who are funding this massive infusion of technology want and need to know the answers to these questions.

The response: This project will demonstrate a way that librarians can answer these questions by providing an outcome-based model, referred to henceforth as the Children's Access to (and Use of) Technology Evaluation (CATE).[10] Because outcome-based measurement has proven persuasive and valuable[10] and because it has been successfully employed by this project staff, it is used as the basis for CATE. The proposed CATE model is an exportable, adaptable model that can be used to evaluate and improve a comprehensive children's technology program in an urban public library.[11] Creative ways must be developed to evaluate programs for children in public libraries that cannot regularly engage in testing programs such as occur in school situations. Outcome measurement is an excellent response to this dilemma and reinforces the IMLS efforts to make this method known and appropriately adopted [12] (See **Design**.)

Project priorities: The project addresses all program priorities for the IMLS National Leadership Grants For Libraries: Research and Demonstration Projects in a unique manner:

- **Priority 1:** Enhance library services through effective and efficient use of new, appropriate technologies. (Goal 2)
- **Priority 2:** Ability of library users to make more effective use of information resources. (Goals 1)
- **Priority 3**: Evaluation of library services. (Goal 1)

Project Goals:

- **Goal 1:** To develop and demonstrate use of a comprehensive outcome-based model (CATE) that public librarians can adopt or adapt to plan and evaluate school age children's access to and use of technology in an urban public library setting using market research techniques. (See **Design**)
- **Goal 2**: To train SLPL librarians in the demonstration project and subsequently librarians nationwide to adopt or adapt and apply this outcome-based model to plan for and to evaluate school age children's access to and use of technology.

Project Objectives:
The project goals will be accomplished by working through ten measurable objectives:

(1) Develop training methods for project librarians that result in competence in all data collection methods.[13]
(2) Gather information on facets of the total library program that impact development of an outcome-based model.
(3) Gather baseline data on children's current use of technology in the library using personal digital assistant methodology, surveys, interviews, focus groups, and a school age child advisory group.
(4) Solicit opinions from children, librarians, parents, teachers, and other community stakeholders about appropriate outcomes of the children's technology program using surveys, interviews, focus groups.
(5) Develop CATE model for evaluating children's access and use of technology applying data collected in #1, 2, 3.
(6) Modify CATE model with community experts' input through a Delphi Study.

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[10] See Institute of Museum and Library Services. *New Directives, New Directions: Documenting Outcomes in IMLS Grants to Libraries* and *Outcome-Based Evaluation for IMLS-Funded Projects for Libraries and Museums.* This project adheres to the logical principles explicated in these publications both in developing the CATE model and in planning training modules. Through PLA planning processes, libraries have become expert at inputs and outputs, but are just moving into outcomes.

[11] The IMLS (see 10 above) definition of program as "a series of services or activities leading towards a distinct and measurable outcome (meaningful change in attitudes, skills, behaviors, conditions, or knowledge)" is employed here. Although the technology program of the public library referred to in this grant is ongoing, measurement can be performed at predetermined periods of time. (**Design)**

[12] The project develops and demonstrates for others an outcome-based model to evaluate and improve a children's technology program (**Design)** and evaluates the success of the project itself using outcome-based measurement (**Evaluation**).

[13] Librarians will assist in the data collection and will understand how and why all data is collected. They will also be involved in program planning, implementation, and measurement.

(7) Develop training methods for project librarians so they become competent applying the model in program development and measurement of outcomes.
(8) Develop and implement program interventions taking into account the needs of urban children and designed to improve children's access to and use of computers as measured by outcomes on the continuum. Gather results during and after interventions, using techniques in objectives 3 and 4.
(9) Evaluate CATE model. Modify the interventions or CATE if necessary based on what is learned in application
(10) Develop a program manual and web-based training course for urban public librarians on reducing the digital divide for school age children, publish in journals, and present at national conferences.

See **Design** and **Evaluation** for more on creativity of project. See **Adaptability** and **Personnel for more** about the likely far-reaching impact of the project.

Adaptability

The use of this outcome-based model will be adaptable for the following reasons:

The CATE model will be demonstrated in a library and community that have needs similar to other urban public libraries. All urban public libraries around the country share the problem of evaluating the use of technology in libraries. There will be widespread interest in adapting a method that answer the questions posed above.
The experience of the project staff used in developing the local CATE model will be carefully documented for use by other libraries. This background will be provided in a web-based portfolio from the beginning of the project, and included in the manual and web-based course.
The CATE model can be easily modified to meet local community needs. Other urban library systems can either apply the model as is, relying on the St. Louis community as a market surrogate, or they can easily adapt the model for use by employing the same market research methodologies including surveys, interviews, and focus groups, as well as a panel of school age children. Libraries that adapt this model will have the Development Diagram to guide their efforts. (See Appendix II)
The CATE model is based on a previously widely adopted model: A somewhat similar Family Literacy Model developed by Dr. L. Holt of SLPL has been used by many libraries for years. (See p. 6 below and Appendix III)
Experts in children's services in urban public libraries will evaluate the grant project and then will be involved in the web-based teaching program. (See **Dissemination)**

Design

Scope of the project: The St. Louis Public Library and its community in partnership with researchers from Florida State University[14] and a consultant from Texas A&M University will develop and test an outcome-based model for planning and evaluating school age children's[15] access to and use of technology in an urban public library setting.

Site of the project: The SLPL serves 396,685 people with a Central Library and 15 branches, an annual budget of $17 million, and 1,622,000 volumes with 33.1 circulations per registered borrower. The users are slightly over 50% minority with 47% of those African American. St. Louis has about 98,000 children under the age of 18 and about 85 percent of them are considered to be "at-risk" i.e., come from low income homes, their parents have a low level of education, often come from single parent homes. Another challenge facing the city of St. Louis is the underachievement of students in the public school systems. In fall 1999, St. Louis pubic schools ranked 115 of 115 in the state and failed to meet state requirements for accreditation. Students were unable to perform

[14] For a description of the Florida State University see Appendix V.
[15] For years, children who frequent the library in non-school hours were labeled in a somewhat derogatory manner as latch key children. In recent years, it has been realized that the public library has a unique opportunity to help these children succeed. ALSC/ALA established a school age children's programming committee in 1999. Children this age are developmentally ready for in-depth computer work (Healy, Jane. *Failure to Connect* 1999). The Carnegie Foundation Council on Adolescent Development, *A Matter of Time Risk and Opportunity in Non-School Hours,* 1992 addressed the need to invest in providing programs for and listening to youth of this age. See also Quinn, Jane "A Matter of Time: An Overview of Themes from the Carnegie Report." VOYA (October 1994): 192-96.

adequately on skills test given in spring of 1999. The technology program at SLPL is crucial for reducing the digital divide. Because its defined user community is urban, majority-minority, and includes many at risk youth the SLPL provides a context that other urban libraries share.

Despite these challenges, SLPL is an acknowledged leader and role model for other public libraries in the United States known for developing innovative services and engaging in research to remain responsive to the needs of the St. Louis citizenry. The mission of the SLPL is itself focused on improved outcomes, which positions the administrators and board to willingly adopt an outcome-based model for planning and evaluation. (See Appendix IV) A 1999 public survey shows users of children's services receive $4 in benefits for every $1 spent.[16] Moreover, SLPL is a Gates Learning Foundation library and e-rate recipient. It is technologically privileged, with more than 650 computers and more ready for installation.[17] Yet SLPL, like other urban libraries, has an urgent need for a model to plan what can appropriately be accomplished in a public library and to evaluate children's access to and use of this massive infusion of technology to assure themselves that it is, indeed, reducing the digital divide, in this instance, for children.

Previous work/proposed contribution: No previous work does what this project proposes. Computer use by children in public libraries has previously been measured by counting computers as "furniture."[18] Children sit at them, but nothing is known about what they really use them for or how efficient or effective their technology use is. We do not know what the outcome of this use is. The project provides a means to answer that question in urban public libraries. This outcome-based model is groundbreaking in several ways; it requires a shift in paradigm in how public children's librarians do their work. Previous public library program planning for school-aged children has been largely embedded in librarian wisdom, based on the notion that what *has* worked, *will* work and on the belief that as long as children come and their parents seem satisfied, the program is working. The digital environment with its connectivity and access to many information sources and services has made the notion of ignoring the consumer, including children and community stakeholders at large, no longer a viable approach. The demand rather than the supply economy of providing children's services will be kept in mind throughout the program design and evaluation process.

This will be the first study to:

- Demonstrate a multi-dimensional, holistic evaluation of children's use of technology in a public library.[19]
- Develop an exportable evaluation model by a public library in a public library.
- Use outcome-based measurement to assess the children's access to and use of technology.
- Employ a user-based, market-drive methodology that includes both children and the community in planning and evaluation of children's services.[20]
- Effect systemic change in children's technology program through a paradigm shift in the planning and evaluation process.
- Demonstrate an evaluation model for children's programs that can be customized to local communities, continuously updated, and that is sustainable.

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[16] For more information on this work see, Holt, Glen E., Elliott, Donald, and Moore, Amonia. "Placing a value on Public Library Services." *Public Libraries* (March/April 1999): 98-108. Holt, Glen E. and Holt, Leslie Edmonds. "What's It Worth?" *School Library Journal* (June 1999): 47.

[17] SLPL was an initial recipient of Gates Funds with Bill Gates appearing at first installation ceremony.

[18] Furniture/equipment use is the category in which computers are included in Walter, Virginia A. *Output Measures for Public Library Service to Children*, 1992.

[19] True program evaluation is largely neglected in all of youth services. The 1989 USDOE institute publication (Dr. Dresang was a planner and speaker and Dr. Holt was a participant) *Evaluation Strategies and Techniques for Public Library Children's Services: A Sourcebook* is the richest source of information on this topic. It focuses, however, on techniques rather than program evaluation. Walter's book above and *Output Measures and More: Planning and Evaluating Public Library Services for Young Adults,* and other major works also neglect program evaluation. Currently 10 urban public libraries are participating in a 3-year project to develop successful activities and partnerships for youth, mostly young adults, which may or may not include technology. The creation of an exportable model for technology program evaluation is not a goal of this study.

[20] While the private sector conducts market research in development of products, little has been done in this area for library services. Currently Christie Koontz and Dean Jue are implementing a two-year project for public libraries in the use of market research techniques, but it does not include specific techniques for children as this project does.

The unique features of this work promise to have far reaching affects on how public library programs for school age children are conceptualized in the 21st century.

An efficient, effective approach designed to reach clear, measurable objectives: The work plan for this demonstration study is divided into five phases intended to accomplish the ten measurable project objectives (see **National Impact** and **Evaluation** for objectives and measurement, Appendix II for project Development Diagram).

The task of the principal investigator and evaluators will be to assure that all data collected and analyzed responds to the question, "What do we need/want to know to develop and evaluate a user/market-based model that public librarians can use to guide planning and evaluation of a successful 21st century public library technology program for at-risk urban children in fourth through eighth grades?"

Phase 1: Train librarians; collect baseline and market research data (surveys, interviews, and focus groups). (December 2000-March 2001) (Objectives 1, 2, 3, 4, 10) (See **Management Plan** for preparedness of SLPL to conduct this demonstration project).

- **Train St. Louis branch librarians**[21] **in research methodologies**. (12/00 – 2/01) Project staff (the PI, evaluators, consultant, and SLPL Project Coordinator) will hold several training sessions for the project librarians as methodologies are developed. Librarians will do some but not all data collection. Researchers will explore means to facilitate ease of data collection.
- **Collect baseline use and access data using existing records, in-house use measurement, surveys, interviews, and focus groups**. (1/01-2/01) Baseline data will include (a) existing facts from records currently kept by the library and (b) data from the SLPL's Cost Benefit Analysis study regarding what children's services the public values, as well as (c) data on in-house use of computers that will be collected using the PDA technique developed by Koontz and Jue.[21] Dr. Koontz and Mr. Jue have agreed to serve as volunteer consultants to the project on the export and use of this technique.
- **Develop market based research instruments interviews, survey, focus groups, and pretest** (1/01) In his book, *The Kids Market: Myths and Realities* (1999), Dr. James U. McNeal, says that "Market research principles and practices were developed by adults for adults. They don't always produce the right results with kids." Dr. McNeal will assist in the development of market research techniques to (a) understand where the children are in relation to various components of the technology program and (b) where they would like to be.
- **Collect market research data**. (2/01-3/01) SLPL librarians, 100 parents and teachers, 100 children, and 25 community leaders will be asked questions. A Children's Advisory Council, (CAC) consisting of 6 regular users (two from each location for implementation[22]) and 3 alternates will be established at the beginning of the project,[23]. The adults and children will reflect the demographics of St. Louis.[24] Most of the children queried throughout the research will be users of the SLPL.[25] The CAC will help the researchers identify non-

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[21] This technique uses a handheld barcode scanner with which librarians document observed activity of library users. Evaluators in use of this technique will train librarians and instructions will be included in web-based information. See *Market-based adult lifelong learning performance measures for public libraries servicing lower income and majority-minority markets, September 1, 1996 - August 31, 1999, Final Report.* http://www.geolib.edu. Although this project was designed for assessment of adult library users, data was collected for children and will be used in the analysis of SLPL data.

[22] Project activities will include representatives of the school district with which SLPL has an excellent working relationship.

[23] Interventions will occur in 3 branches of SLPL that represent the highest community needs (Appendix IV). The Human Subjects Research approval process at Florida State University and at SLPL will be followed for all research involving youth or adults and proper permission will be obtained for any interventions that include research with children.

[24] As is customary in SLPL, adults and children will be paid a token amount for their participation in formal research such as focus groups (not for informal activities such as filling out a form at the end of a program).

[25] No attempt will be made to track specific children, but the idea of a market surrogate will be used. This is a modification of what Richard A. Berk and Peter H. Rossi call the "interrupted time series" methodology (*Thinking About Program Evaluation* 1990 87-89). "Interrupted time series designs are based on repeated measures, over time, of some outcome. Simply put, the idea is to compare the time trend before an intervention with the time trend after." This

users (program intervention) who will also be queried to assist in providing more access and attracting more users (part of the planning).

Phase 2: Develop CATE outcome-based model and refine using Delphi Study. (April - June 2001) (Objectives 5, 6, 10)

- **Develop preliminary outcome-based model.** (4/01) The outcome-based model will be presented as a continuum in a *format* similar to the Family Literacy Model (FLM) (see Appendix III). It has proved extremely robust as it was first developed by Dr. Leslie Holt a decade ago, is used in many libraries, and was used at SLPL in a recent study on family literacy, Project Real. However, the CATE model for evaluating a children's technology program[26] will differ radically in content from the FLM. The FLM exists of levels of inputs (services given TO users). Following is an example of how the FLM model would change if it consisted of outcomes:

TABLE I -- INPUT/OUTCOME FLM MODEL COMPARISON (EXAMPLE)

Program Components	*Level 1 Family Literacy Continuum (input) (original model)*	*Level 1 Public Library Children's Program Model (outcome) (model revised to parallel Children's Technology Program Model)*
Collection	Print collection for infants to age eight. Including board books, readers, picture books, fiction and non-fiction. Weed to keep collection fresh and current.	Children ages infancy through eight find (or have found for them) more fiction and non-fiction books that meet their recreational or information needs. Indicators: increased use of collection; increased informal expressions of satisfaction from children and caretakers; increased satisfaction when appropriately questioned.

While the program components of the FLM for which the continuum is built are overall programmatic and administrative areas (collections, programs, materials produced, individualized services, partnerships, recruitment/promotion), components of the CTM for which a continuum will be built are directly related to the technology program.

Suggested initial program components and subcomponents for CATE model are:

- **Digital information sources.**
- **Digital recreation sources.**
- **Digital application sources (subcomponents: word processing, databases, graphics).**
- **Digital finding tools for resources (subcomponents: electronic catalog, search engines).**
- **Digital communication tools (subcomponents: e-mail, listservs or chat rooms).**

For each of these components and subcomponents, there will be a continuum of outcomes with five "sign posts" along the continuum from passive presence to active connection and involvement.[27] The final model will have at least nine (see above) program components and subcomponents with 5 continuum cells for each. The continuum describes milestones along the way with continuous movement as children become more adept at using computers. The continuum will be worked out for each program component (including each application) and will include indicators for public librarians to look for, data sources, data collection points, and program targets (which will most likely always be determined in the local library). Following in Table III is an example of what Digital Information Sources, one of the components of the CTM, with the Level I and the Level V outcomes on a continuum might look like.[28]

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is one way to solve the problem that public libraries have in not being able to test specific children's skills. It is a holistic view at the population served.

[26] Program here means the entire array of services and activities related to technology for children in a public library.

[27] Previous research conducted by Drs. Holt, Dresang, and Gross will have a baring on this model. See Personnel and Resumes in Appendix I.

[28] This is adapting the model from IMLS *Outcome-Based Evaluation for IMLS-Funded Projects for Libraries and Museums* model from United Way of American *Measuring Program Outcomes: A Practical Approach.*

TABLE III -- **Children's Access to Technology Evaluation (CATE)**

Program Components	*Level I Children's Access Technology Evaluation (CATE)* **(outcome)**	*Level V Children's Technology Program (outcome)*
Digital Information Sources	Children ages 9 - 14 succeed more often in search for simple factual information in preselected digita information sources. Indicators: Access: Children have access to factual digital information sources. Use: Children go directly to computers to search for factual information in straightforward information sources. Children ask for assistance less often in searching for factual information. Children express more satisfaction with search. Data Sources: Self-reports, surveys, focus groups, program records, PDA & other observation. Data Collection Point: Throughout the project, including after each specific intervention. Program Target: To be Determined in development of model.	Children ages 9 - 14 succeed more often in search for complex information using wide range of digital resources chosen for them-selves. Children have more in-depth knowledge of topic they are researching. Indicators: Access: Children have access to wide variety of digital information sources. Use: Children choose more complex digital informatic sources. Children ask for assistance less often in searching for information on complex topics. Children discuss topic that they are researching with more sophistication, indicating higher level thinking skills. Children correlate digital information sources with other information sources. Data Sources: Self-reports, surveys, interviews, focus groups, program records, PDA & other observation, Children's Advisory Group Report. Data Collection Point: Throughout the project including after each specific intervention. Program Target: To be determined in development of model.

- **Perform Delphi study using key informants from the community**. (4/01-5/01) After CATE is developed, reaction to it will be solicited using a Delphi technique with 15 identified community leaders in St. Louis who are stakeholders in success of school age children. These leaders will be pre-selected, will not be contacted during Phase 2, and will be policy makers in their organizations. The Delphi study will be conducted electronically; using as many rounds as it takes to reach consensus on CATE.
- Analyze data/adapt model for use in project. (5/01-6/01) After the CTM is complete, it will be adapted using information gathered in the Delphi Study.

Phase 3. Train librarians. Develop, deliver, and evaluate the pilot trial interventions for the outcome-based children's technology program using CATE model. (July 2001-June 2002) (Objectives 7, 8)

- **Train St. Louis branch librarians in use of outcome-based model to plan and evaluate**. (7/01-8/01) Drs. Holt, Dresang, and Gross will train the St. Louis librarians on the outcome-based model to provide skills to develop and to support the newly designed products and services.
- **Develop and deliver new products and services**. (8/01–6/02) (See Appendix VIII for sample interventions) Dr. L. Holt and SLPL youth librarians will plan interventions. A multifaceted approach, taking into account the needs of urban children, will be employed. Although this approach cannot be planned until the data in Phases 1 and 2 is collected, suggestions of possible interventions that are in line with the SLPL mission and policies and what is *now known* about users and stakeholders can be found in Appendix IV.
- **Measure outcomes of individual products and services.** (8/01–6/02) The major tasks of this phase are to develop, deliver, and evaluate the pilot products and services that are the trial interventions to improve the outcomes of children's access to and use of technology. Much of the CATE model building will be effected by data collected during this important testing phase of the study.

Phase 4. Evaluate overall program outcomes as well as project outcomes. Modify CATE model if needed. (June 2002 - August 2002) (Objectives 9, 10)

- Replicate collection of baseline data. (6/02-7/02)
- Replicate collection of market research data. (6/02-7/02)
- Analyze data from phases 3 and 4 and perform program evaluation using CATE. (7/02 -8/02)
- Evaluate results of project (8/02) (See **Evaluation**)

Market research methods are once again applied and the data collected in phases 3 and 4 are compared to the data collected in phase 1 in order to measure changes in school aged use of technology in the library. This data will be compared to Phase 1 data to measure changes in terms of how the librarians are spending their time on behalf of the children, their level of attained technology skills, and their knowledge of and attitudes toward the outcome-based, market-research approach to evaluating a children's technology program. The user and stakeholder data will be analyzed for outcomes to determine whether user and librarian views of outcomes match.

Phase 5 Dissemination activities (December 2000 - November 2002) (Objective 10)
Dissemination will be ongoing throughout the project, but some permanent products will be produced in the final months. **(See Dissemination)**

MANAGEMENT PLAN

The governing board of the SLPL encourages and supports applied research. The project's PI, Dr. Leslie Holt, and the library director, Dr. Glen Holt, have successfully conducted extensive funded applied research for more than a decade in the SLPL, demonstrating their ability to collect reliable data. They have developed many action timelines and successfully followed them. The mission of the SLPL supports outcome-based measurement. The sub-contractors for the project, Dr. E. Dresang and Dr. M. Gross have conducted both academic and applied research with children. All project personnel have directed projects in which hundreds of surveys, interviews, and focus groups have successfully taken place, including focus groups with non-English speaking users and with persons from poverty backgrounds. The SLPL has just completed Project Real, directed by Dr. L. Holt, a $200,000 project funded by the U.S. DOE and both Drs. Holt are completing in August 2000 a $200,000 grant for a Cost Benefit Analysis Study funded by IMLS. The results of this study plus public support for bond referenda indicate the public believes the SLPL is managing its resources well. Dr. Dresang, as an administrator in the Madison (WI) school district for libraries/technology, managed an annual budget of $7 million and oversaw 5 successful technology referenda and 2 multiyear program evaluations. She directed implementation of 2 USDOE grants for $188,000 in 1996-97, resulting in a weeklong training institute that participants rated 4.98 on a scale of 5. The Florida Library Association sponsored its replication. The researchers bring almost 100 years of management in library systems to the project. (See **Personnel**) The SLPL will hire a project manager with appropriate skills to oversee the project (see **Budget Narrative** and **Appendix** I for job description)

BUDGET

The Drs. Holt and Dr. Dresang have administered multimillion-dollar budgets for numerous years (see **Management Plan)**. The attached budget and budget narrative explain the careful deployment of funds to accomplish the goals and objectives of the project.

PERSONNEL

Dr. Leslie Edmonds Holt has been SLPL's director of youth services since 1990. Dr. L. Holt, in addition to her MLS, holds a doctorate in Curriculum and Reading. She served as co-principal investigator for the research in youth cognition and visual recognition that became the basis for the CARL "Kid's Catalog." She was the project director for Project REAL that developed a model for family literacy programs in public libraries and she is a co-investigator with Glen E. Holt and Donald Elliott in the IMLS funded cost benefit analysis of five urban public libraries. Dr. Holt is past President of the Association of Library Service for Children (ALSC), a division of ALA, and is a recognized national leader in the area of research and practice of youth services.

Dr. Eliza T. Dresang is an associate professor at Florida State University and former Director of Library, Technology and Communication in the Madison (WI) School District, consistently rated as one of the top 5 school districts in the country, and a former public librarian. Dr. Dresang is an expert in evaluation of children's services, serving as a consultant for and presenter at the only national symposium held on the topic. She oversaw two multiyear evaluations of the school media program in the MMSD, one of which resulted in an exemplary rating from the State and runner-up for National School Library Media Program. Her current research interests focus on children's use of resources in the digital environment. She has written a 1999 award winning book on the topic in which she identifies the digital environment principles of interactivity, connectivity, and access that will influence the development CATE. Dr. Dresang is a member of the Board of Directors of ALSC and of the ALA Council. She is a consultant to public library systems, including evaluating a technology-training program for the North Suburban Illinois Library System.

Dr. Melissa Gross: An assistant professor at Florida State University and former adjunct professor at UCLA and at UC-San Jose. Dr. Gross has developed a unique model of information seeking behavior through her research with elementary school aged children. It differentiates between self-generated queries (questions people pursue in libraries for their own informational or recreational uses) and imposed queries (questions users bring to the library because someone else has asked them to, as in school assignments). This research will influence the development of the outcome-based model proposed in this study in differentiating between the outcome of using digital sources for self-generated versus imposed needs. Dr. Gross teaches in the areas of program planning, research methods, and user information-seeking behavior. She has served as a consultant to the Los Angeles Public Library and Santa Monica Public Library in youth and parent services and most recently completed a reference evaluation project that involved 13 public libraries in Southern California.

Dr. Glen E. Holt: Executive director of SLPL since 1987 developed a methodology for cost benefit analysis of public libraries. Author of many articles on management of libraries and applied research.

Dr. James U. McNeal: Professor of Marketing at Texas A&M University. He is the author of more than 80 articles and five books. His most recent book is *The Kids Market: Myths and Realities* (1999). Earlier book were *A Bibliography of Research and Writings in Marketing and Advertising to Children* (1991) and *Kids as Customers* (1992). His consulting clients include AT&T, Coca-Cola, Delta Airlines, and Walt Disney. He conducts studies of children's consumer behavior in both domestic and global settings and is familiar with culture variances.

EVALUATION

An Evaluation Portfolio will be created to facilitate both formative and summative evaluation.[29] This portfolio will be web-based, continuously updated, and public throughout the project. SLPL librarians and the Children's Advisory Council will participate in both formative and summative evaluation. They will be joined at the end by a nationwide panel of five urban public library coordinators of children's services who will be invited to evaluate the success of Project CATE .[30] They will be asked to take each of the project goals and objectives, look at the portfolio contents, and comment on the outcomes. See Table IV for the evaluation scheme.

TABLE IV -- Evaluation Plan for Grant Implementation

Project Objectives	*Intended Outcomes*	*Formative Evaluation Measurements*	*Summative Evaluation Measurements*
#1 Develop training methods for librarians in data collection	Librarians assist in competently and confidently collecting high quality data.	Survey librarians before training and after data collection to determine increase in competence and confidence. Researchers find data collected is useful in developing model.	Panel rates training Module at least 4.5 on scale of 1 -5 based on evidence in portfolio.
#2,3,4 Collect data.	High quality data Collected to use in developing CATE model.	Compare base line in-house data in SLPL with that collected in other libraries. Analyze data using content analysis.	Panel rates data collected From existing documents, in-house methods, and market research at least 4.5 on scale of 1-5 based on evidence in portfolio.
#5, 6, 8 Construct and evaluate CATE model.	Demonstrated used and useful CATE model.	Ability of Delphi Panel to reach consensus. Data collected applied to develop CATE model.	Panel rates usefulness of CATE for evaluating Children's access to and use of technology in Public libraries at least 4.5 on scale of 5 based on evidence in portfolio.

[29] Portfolio here means a collection of all activities, reports, processes, interventions, placed in the portfolio soon after they are created and presented in a way that is easily accessible to someone new to the information or project.

			7 of 10 agree to participate in web course & use CATE.
#7 Train librarians to use CATE.	Librarians plan, implement, and evaluate programs more competently and confidently using CATE model.	Survey librarians before training, during and after program Intervention express increased competence and confidence.	Panel rates success of Librarians training to use CATE model at least 4.5 on scale of 5 based on evidence in portfolio.
#9 Disseminate results.	Web site, articles, Web course, manual Developed and used To plan and evaluate Children's access to Technology. Long term Outcome is evidence that Digital divide IS effect-ively reduced	At least 5 articles Accepted for publication, Course has at least 20 participants Who express satisfaction, manual is purchased by at least 50 libraries.	Panel rates usefulness and Quality of products and publications at least 4.5 on scale of 5 based on product examination. 7 of 10 panelists see project as useful in reducing the digital divide for children in poverty.

The panel will then be asked to comment on whether, in light of their evaluation of the objectives, the goals have been achieved.

Dissemination

Dissemination will begin in the earliest stages of the project that will be available nationwide. A program portfolio will be linked from the SLPL web site, and all programmatic and evaluative activities of the project will be posted there throughout. Both SLPL and FSU will provide technical maintenance for the site. A print instruction manual will be developed. Dissemination of project findings and results will also be submitted to library and information science and marketing periodicals for publication and presented at professional meetings. In the past 2 years, Drs. Holt, Dresang, and Gross have published articles in *School Library Journal, Journal of Youth Services for Libraries, American Libraries, Library Trends, Library Quarterly, RUSQ, the Looking Glass, LISR, the Journal of Youth Advocates, Educational Media and Technology Yearbook,* and *2000 School Library Media Quarterly* so will easily find milieus for ongoing dissemination. Dr. McNeal may also publish results in marketing journals. All urban public library directors and coordinators of children's services in urban public libraries, all state children's coordinators, and the Urban Library Council will be informed of the study during its implementation and will be invited to take the course or to invite their library staff or other appropriate persons to take the course when it is offered. (See **Appendix VI** for examples of web site courses developed by the Florida State University School of Information Studies)

SUSTAINABILITY

This will be the first attempt to modify and update an evaluation process on a continuous basis. Constant monitoring and updating of CATE is a new experiment in coping with change in the digital environment. FSU has granted permission for CATE evaluative products to remain on its server, linked to the SLPL. Both the web site and the CATE model will be interactive. There will be a discussion forum on which anyone can place comments or suggestions. Librarians who take the course (and others who are interested) will be asked to post successful activities and services (or improvements of other facets of their overall library program they feel is related to technology), i.e., ways in which they have helped students achieve the outcomes on the model. Although, it is expected that the model itself will not need modification right away, librarians will be asked to comment via the web site about ways in which they see the outcomes themselves needing modification. The web-based course will be repeated as long as there is interest at the modest continuing education fee. The project manual with instructions and context for evaluation will continue to be updated periodically and available at cost.

Long Term Sustainability: Not only do the project directors plan to disseminate and maintain this project, they also plan to approach the American Library Association/Library Service to Children with the CATE model if it is successful for official adoption and dissemination through the Association and then profession with possible expansion to other aspects of children's programs in libraries.

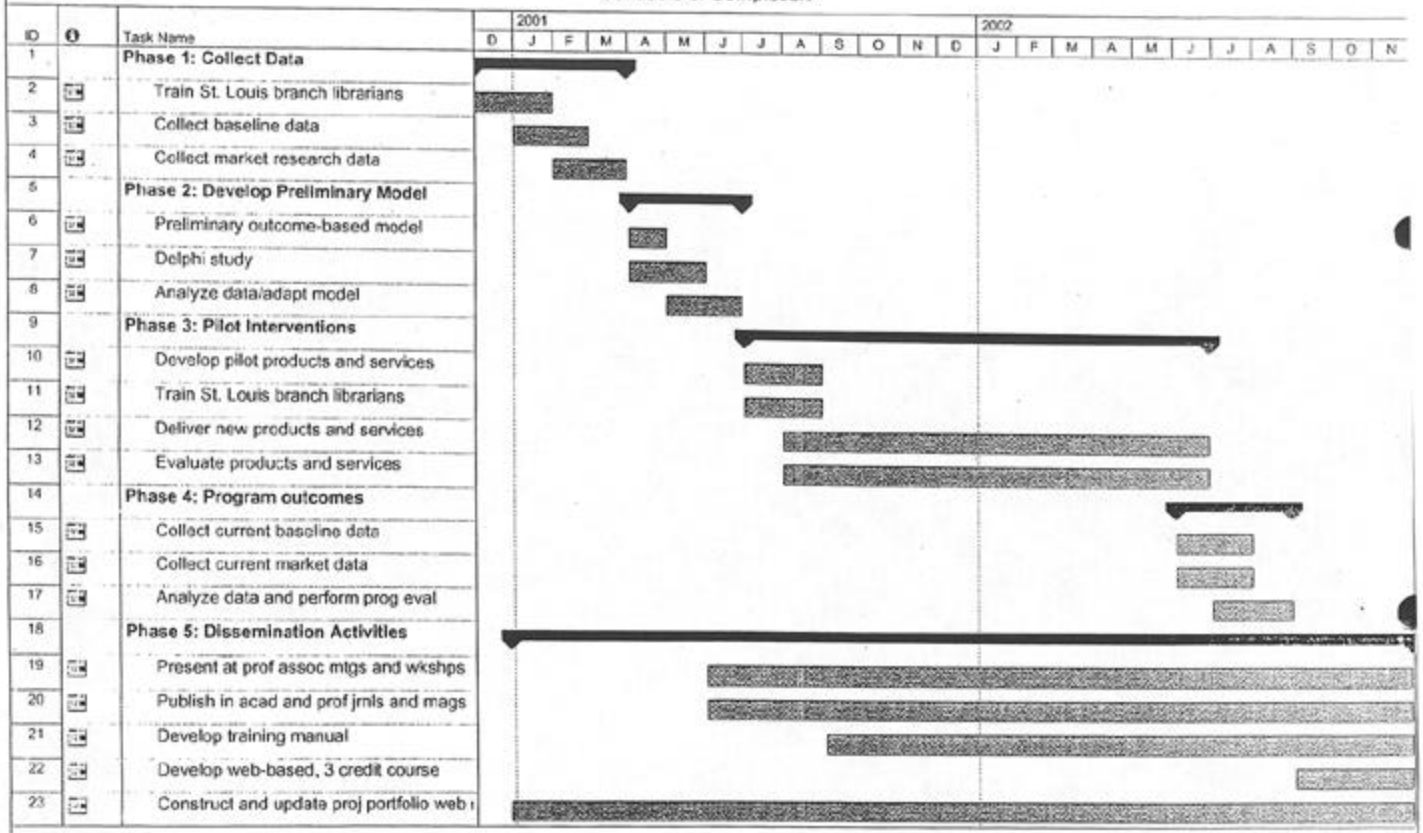
Schedule of Completion

Project CATE

Budget

Phase I **Collect Data**	$46,357
Train St. Louis branch librarians	
Collect baseline data	
Collect market research data	
Phase II **Develop Preliminary Model**	$42,937
Preliminary outcome-based model	
Delphi study	
Analyze data/adapt model	
Phase III **Pilot Interventions**	$56,066
Develop pilot products and services	
Train SLPL librarians	
Deliver new products and services	
Evaluate products and services	
Phase IV **Program Outcomes**	$32,672
Collect Current baseline data	
Collect current market data	
Analyze data and evaluate program	
Phase V **Dissemination Activities**	$40,789
Present at professional meetings	
Publish in academic and professional journals	
Develop training manual	
Develop web-based, 3 credit course	
Construct and update project portfolio	
IMLS Total:	$218,821

PROJECT CATE
Schedule of Completion



Project Budget Form
Section 1: Detailed Budget
Year 1 – Budget Period from December 31, 2000 to December 30, 2001

Name of SLPL Organization St. Louis Public Library (SLPL)
Name of FSU Organization Florida State University (FSU)

Salaries and Wages (Permanent Staff)

	IMLS	SLPL	FSU	Total
1. Leslie Edmonds Holt (PI) 20% time				
2. Glen E. Holt (Researcher) 10% time				
3. Patricia Carleton (services manager) 10% time				
4. SLPL Branch Staff (MLS) 200 hours at $30 per hour				
5. SLPL Computer Services Staff 50 hours at $30 per hour				
6. SLPL Clerical 15% time				
7. Eliza Dresang, Evaluator A. Academic Year @20% B. Summer @33%				
8. Melissa Gross A. Academic Year @20% B. Summer @33%				
9. Graduate Assistant (FSU) 760 hours at $10				
Total Salaries and Wages	**$19,566**	**$46,200**	**$21,756**	**$87,522**

Salaries and Wages (Temporary Staff Hired for Project)

	IMSL	SLPL	FSU	Total
1. Project Coordinator 50% Salary				
2. Children's Activity Staff 3 people, 15 hours per week, 40 weeks (no benefits)				
Total Salaries and Wages				

Fringe Benefits

SLPL				
Evaluators				
Graduate Assistant				
Total Fringe Benefits				

Consultant Fees

	IMLS	SLPL	FSU	Total
(Market Survey) $1,500 per day, 3days	3,000	1,500		4,500
Programmer (FSU) 120 hours @ $15	1,800			1,800
Web Design (SLPL) 50 hours@ $50	2,500			2,500
Total Consultant Fees	**$7,300**	**$1,500**		**$8,800**

Travel

	IMLS	SLPL	FSU	Total
McNeal Texas to St. Louis, 3 days	1,200			1,200
L Holt ALA for workshop		1,200		1,200
Evaluators ALA for Workshop 2 people @ 1,200	2,400			2,400
Travel to IMLS 2 persons @$2,000	4,000			4,000
Evaluators to St. Louis 2 people, 3 trips @ $1,300	7,800			7,800
Total Travel Costs	**$15,400**	**$1,200**		**$16,600**

Materials, Supplies and Equipment

	IMLS	SLPL	FSU	Total
Training Materials		1,000		1,000
Surveys, Delphi Mailings, Questionnaires		3,000		3,000
Hand Held PDA for Data Collection, 3 @ $1,000	3,000			3,000
Total Costs of Materials, Supplies and Equipment:	**$3,000**	**$4,000**		**$7,000**

Services

	IMLS	SLPL	FSU	Total
Focus Groups 18 @$500	9,000			9,000
Total Services Costs:	**$9,000**			**$9,000**

Other

	IMLS	SLPL	FSU	Total
Software & Collection Development	17,500			17,500
Teacher & Parent Training/Programs	3,300	1,500		4,800
Children's Programs	10,500	3,500		14,000
Tuition for Graduate Assistant, 18 hours @ $1.27, 9 hours @ $1.36	3,509			3,509
Total Other Costs:	**$17,309**	**$22,500**		**$39,809**
Total Direct Project Costs	**$105,443**	**$86,026**	**$26,699**	**$218,168**
Indirect Costs				
FSU Indirect costs 26% of $35,813	9,311			9,311
SLPL Indirect Costs 20% of $86,026		17,205		17,205
Total indirect Costs	**$9,311**	**$17,205**		**26,516**

Project Budget Form
Section 1: Detailed Budget
Year 2 – Budget Period from December 31, 2001 to December 30, 2002

Name of SLPL Organization St. Louis Public Library (SLPL)
Name of FSU Organization Florida State University (FSU)

Salaries and Wages (Permanent Staff)

	IMLS	SLPL	FSU (FSU)	Total
5. Leslie Edmonds Holt (PI) 20% time				
6. Glen E. Holt (Researcher) 10% time				
7. Patricia Carleton (services manager) 10% time				
8. SLPL Branch Staff (MLS) 200 hours at $30 per hour				
5. SLPL Computer Services Staff 50 hours at $30 per hour				
6. SLPL Clerical 15% time				
7. Eliza Dresang, Evaluator A. Academic Year @20% B. Summer @33%				
10. Melissa Gross A. Academic Year @20% B. Summer @33%				
11. Graduate Assistant (FSU) 912 hours @ $10				
Total Salaries and Wages	**$21,445**	**$46,900**	**$22,409**	**$90,754**

Salaries and Wages (Temporary Staff Hired for Project)

	IMSL	SLPL	FSU	Total
3. Project Coordinator 50% Salary				
4. Children's Activity Staff 3 people, 15 hours per week, 40 weeks (no benefits)				
Total Salaries and Wages				

Fringe Benefits

SLPL

Evaluators

Graduate Assistant

Total Fringe Benefits

Consultant Fees

	IMLS	SLPL	FSU	Total
Programmer (FSU) 120 hours @ $15	1,800			1,800
Web Design (SLPL) 50 hours @ $50	2,500			2,500
Total Consultant Fees	**$4,300**			**$4,300**

Travel

	IMLS	SLPL	FSU	Total
L Holt ALA for workshop		1,200		1,200
Evaluators ALA for Workshop 2 people @ 1,200	2,400			2,400
Travel to IMLS 2 persons @$2,000	4,000			4,000
Evaluators to St. Louis 2 people, 2 trips @ $1,300	5,200			5,200
Total Travel Costs	**$11,600**	**$1,200**		**$12,800**

Materials, Supplies and Equipment

	IMLS	SLPL	FSU	Total
Training Materials/ Manual	5,000	2,000		7,000
Surveys, Delphi Mailings, Questionnaires	2,000			2,000
Total Costs of Materials, Supplies and Equipment:	**$5,000**	**$4,000**		**$9,000**

Services

	IMLS	SLPL	FSU	Total
Evaluation Panel 5 people @$300	1,500			1,500
Total Services Costs: $1,500				**$1,500**

Other		IMLS	SLPL	FSU	Total
Software & Collection Development		17,500			17,500
Teacher & Parent Training/Programs	3,300	1,500			4,800
Children's Programs	10,500	3,500			14,000
Tuition for Graduate Assistant, 18 hours @ $1.36, 9 hours @ $1.45		3,754			3,754
Total Other Costs:		**$17,554**	**$22,500**		**$40,054**
Total Direct Project Costs:		$95,342	$85,387	$27,472	$208,201
Indirect Costs					
FSU Indirect costs 26% of $35,167		9,143			9,143
SLPL Indirect Costs 20% of $85,387			17,077		17,077
Total Indirect Costs		**$9,143**	**$17,077**		**26,220**

Project Budget Form
Section 2: Summary Budget

Name of Applicant Organization: St. Louis Public Library

Direct Costs	IMLS	Applicant	Partner	Total
SALARIES & WAGES 235,076				
FRINGE BENEFITS 42,430				
CONSULTANT FEES 13,100	11,600	1,500		
TRAVEL 29,400	27,000	2,400		
MATERIALS, SUPPLIES & EQUIPMENT 16,000	8,000	8,000		
SERVICES 10,500	10,500			
OTHER 79,863	34,863	45,000	____	
Amount	$200,785	$171,413	$54,171	$426,369
Indirect Costs	18,454	34,282		34,282
Total Project Costs	**$219,239**	**$205,695**	**$54,171**	**$479,105**

527,36

460,651

Amount of Cash-Match 0

Amount of In-Kind Match $259,866

Total Amount Match $259,866

Amount Requested from IMLS $219,239

Percentage of Total Project Costs Requested from IMLS 46%

Have you received or requested funds for any of these project activities from another Federal agency?

___Yes _X_ No

Reducing the Digital Divide: An Outcome-Based Model for Evaluating School Aged Children's Access to and Use of Technology In an Urban Public Library (Project CATE)

Project Budget Narrative

The St. Louis Public Library (SLPL) is requesting a grant in the amount of $219,239 from the Institute of Museum and Library Services. The St. Louis Public Library and the Florida State University will match the request with $259,239.

Consultant fees will be paid to Dr. James McNeal for his assistance in developing the market research instrument for data collection with St. Louis children.

FSU will employ a computer programmer to aid in data analysis and mounting the Internet training component and other programming tasks associated with dissemination of information on Project CATE.

SLPL will contract from web based design services to improve and expand the Kids Zone portion of the SLPL home page and to mount items for dissemination on the SLPL home page.

Services: SLPL will hire leaders for focus groups for children, parents and teachers as part of the market research. Both leaders and participants are paid.

Members of the evaluation panel will be offered $300 for their work.

The Florida State University will contribute the use of its server for the development and maintenance of a web-based course to train librarians to use the outcome-based model for evaluating school aged children's access to and use of technology.

Supplies & Materials: Three Personal Digital Assistants (PDAs) will be purchased for use in data collection at the three participating branches. These are at half their market value, which is contributed by the manufacturers. The Florida State University will contribute telephone, supplies, and photocopying costs for Drs Dresang and Gross.

Travel: Travel moneys will be used to pay for Drs. Dresang and Gross to travel 3 times in year 1 and 2 times in year2to the St. Louis Public library for training and evaluation activities. Dresang and Gross will attend two American Library Association meetings for presentation of results. Leslie Holt will also attend ALA for presentation of results and dissemination with these trips paid for by SLPL. There will be one trip for Dr. McNeal to consult on design of marketing instruments to involve children; and $4000 per year for attendance at IMLS meetings as outlined in the National Leadership Grant application.

Other: FSU requires that tuition be paid to all graduate assistants.

SLPL will invest in software and books and other materials for school aged children at each of the three project sites.

SLP will cover the cost of regular instructional programs for teachers, parents and children. The grant will pay for the cost of the intervention programs developed as part of Project CATE.

Indirect Costs: FSU has a negotiated rate of 26% for research done in partnership where the majority of the work and the support of the project are done by the other agency. This cost is charged to JMLS. In Year I the base for indirect costs to FSU is calculated on the amount of funding from IMLS that will be contracted to FSU minus the equipment cost. Year 2 the base for indirect costs to FSU is the amount of funding from IMLS that will be contracted to FSU. SLPL will donate the rest of the indirect costs.